

## Claims

1. A method for transformation of potato plants by transforming  
5 potato plant cells with an expression vector comprising
- a) regulatory sequences of a promoter active in plants;
  - 10 b) operably linked thereto a DNA sequence encoding a protein with the biological activity of an AHA synthase resistant to inhibitors of potato plant wildtype AHA synthase; and
  - 15 c) operably linked thereto regulatory sequences which serve as transcription termination and/or polyadenylation signals in plants,
- selecting for AHA synthase inhibitor resistant cells and regenerating them to transgenic plants.
- 20 2. A method for transformation according to claim 1, wherein the expression vector comprises a DNA sequence according to SEQ-ID No. 1.
3. A method for transformation according to claim 1, wherein the  
25 DNA sequence encoding a protein with the biological activity of an AHA synthase resistant to inhibitors of potato plant wildtype AHA synthase is selected from the group consisting of
- 30 a) DNA sequence comprising a nucleotide according to SEQ-ID NO. 1;
  - b) DNA sequence comprising a nucleotide sequence which hybridizes to a complementary strand of the nucleotide  
35 sequence a)
  - c) DNA sequence comprising a nucleotide sequence which is degenerate to the nucleotide sequence of a) and
  - 40 d) DNA sequence being a derivative, analogue or fragment of a nucleotide sequence of a), b) or c) and encoding a protein possessing AHA synthase activity and conferring resistance to AHA synthase inhibitors.

4. A method for transformation according to any of claims 1 to 3, wherein the AHA synthase promoter from *Arabidopsis thaliana* or the nos promoter is used.
- 5 5. A method for transformation according to any of claims 1 to 4, wherein the AHA synthase terminator from *Arabidopsis thaliana* or the OCS terminator is used.
6. A method for transformation according to any of claims 1 to 5, wherein for selection a imidazolinone type herbicide is used.
- 10 7. A method for transformation according to claim 6, wherein for selection (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methoxymethylnicotinic acid is used.
- 15 8. A plant expression vector according to claim 1 or 2 additionally comprising a heterologous DNA sequence.
- 20 9. A plant expression vector according to claim 8, wherein the heterologous DNA sequence encodes a peptide, protein, antisense-, sense-RNA, viral RNA or ribozyme.
- 25 10. A plant expression vector according to claim 9, wherein the heterologous DNA sequence contains information that causes changes in the carbohydrate concentration and the carbohydrate composition of regenerated potato plants.
- 30 11. A plant expression vector according to claim 10, wherein the heterologous DNA sequence contains information that causes the increased production of amylopectin type starches.
- 35 12. A plant expression vector according to claim 10, wherein the heterologous DNA sequence contains information that causes the increased production of amylose type starches.
- 40 13. A transgenic potato plant cell produced by the method for transformation according to any of claims 1 to 7 and containing a plant expression vector according to any of claims 8 to 12.
- 45 14. A transgenic potato plant produced by the method of transformation according to any of claims 1 to 7, wherein the regenerated plant exhibits an elevated resistance to imidazolinone type herbicides.

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15. Harvest product of the transgenic potato plant according to any of claims 13 and 14 comprising a DNA sequence SEQ ID No. 1 or a DNA sequence according to claim 3.
- 5 16. Harvest product according to claim 15 wherein the harvest product is a tuber.
17. Propagation material of transgenic potato plants comprising a DNA sequence SEQ ID No. 1 or a DNA sequence according to claim 3.
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18. Use of a DNA sequence SEQ ID No. 1 according to claim 2 or a DNA sequence according to claim 3, or a plant expression vector according to of any of claims 8 to 12 in potato plant cells, potato tissue cultures, potato plants and/or potato plant breeding.
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